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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,101	04/17/2002	Andrew Mills	SGU-0050	7501

7590 12/18/2003
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Chantilly, VA 20153-1200

EXAMINER

STAICOVICI, STEFAN

ART UNIT PAPER NUMBER

1732

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,101

Applicant(s)

MILLS ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on October 3, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
- 4a) Of the above claim(s) 24-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-23 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2/22/2002.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of Group I filed September 5, 2003 is acknowledged.

The traversal is on the ground(s) that the European Patent Office determined that Groups I and II form a single inventive entity under PCT Rule 13.1. In response it should be noted that the determination of the European Patent Office is not binding on the present examination process.

Further, Applicants argue that under MPEP §803, "if the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions" (see page 2 of the election response October 3, 2003). In response, it should be noted that Applicants' response is drawn to restriction procedure made under U.S. patent law, whereas the restriction practice in the instant application falls under Rule 13.1 of the Patent Cooperation Treaty.

Specifically, it is noted that in the restriction requirement mailed September 5, 2003, it was stated that:

all the groups are directed to an article, apparatus and a process useful in the general field of a composite molded article. Specifically, Group I has a *special technical feature* (emphasis added) directed to the channels of a nodal mold not required for Groups II-III. Group II has a special technical feature directed to a feeder head not required for Groups I and III. Group III has a special technical feature directed to an envelope of fibers surrounding a core of expansible material and a process useful in the general field of a composite molded article.

Therefore, Group II has a special technical feature directed to a feeder head that does not include the special technical feature of the channels of a nodal mold of Group I.

The requirement is still deemed proper and is therefore made FINAL.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Method of Molding a Reinforced Nodal Structure".

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "44" (page 10, line 6); "67" (page 11, line 13); "70" (page 11, line 15); "28" (page 12, line 1); "46" (page 13, line 4). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "48" (Figures 9 and 10); "47" (Figure 10); "54" (Figure 13). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 32 is objected to because of the following informalities: the claim is dependent on a non-elected claim 28. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266.

GB 1 373 344 teaches the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels (24) of a nodal mold (21), closing said mold with pressure plates (26) and curing said resin (see page 1, lines 70-89; page 2, lines 8-35; Figures 1-2).

Regarding claims 17-18, although GB 1 373 344 teaches a plurality of resin pre-impregnated fibers having constant cross-section, GB 1 373 344 does not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated carbon fibers in the

process of GB 1 373 344 because, FR 2 462 266 specifically teaches that a fiber reinforced material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

In regard to claim 19, GB 1 373 344 teaches compressing rubber blocks (13, 14) by a top pressure plate (12) such that said resin pre-impregnated carbon fibers are being compressed. It is submitted that an overfill is present in order for compaction of said resin pre-impregnated carbon fibers to occur.

8. Claims 17-18 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266.

Huybrechts *et al.* ('274) teach the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels of a compaction tool (rib compaction area), closing said compaction tool with a vacuum bag and curing said resin in an autoclave (see Abstract).

Regarding claims 17-18, although Huybrechts *et al.* ('274) teach a plurality of resin pre-impregnated fibers having constant cross-section, Huybrechts *et al.* ('274) do not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated fibers in the process of Huybrechts *et al.* ('274) because, FR 2 462 266 specifically teaches that a fiber reinforced

material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

In regard to claim 32, Huybrechts *et al.* ('274) teach bagging and curing in an autoclave. It is submitted that bagging includes a step of drawing a vacuum onto said bag in order for the pressure in the autoclave to be greater than the pressure inside the bag.

9. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of Koury (US Patent No. 6,073,670).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claims 20-21, GB 1 373 344 in view of FR 2 462 266 does not teach a feeder head under computer numerical control that severs length of reinforcement material. Koury ('670) teaches a fiber placement head that places fiber material into channels of a nodal mold such that both the fiber head and the mold are movable and under computer numerical control (see col. 3, lines 19-53). Further, Koury ('670) teaches that said fiber placement head includes a cutter means (see col. 4, lines 35-36). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of reinforcement material as taught by Koury ('670) in the process of GB 1 373 344 in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained.

In regard to claim 22, GB 1 373 344 in view of FR 2 462 266 do not teach a tacky reinforcement. Koury ('670) specifically teaches a tacky reinforcement material that is placed

into channels of a nodal mold (see col. 4, lines 5-10). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of tacky reinforcement material as taught by Koury ('670) in the process of GB 1 373 344 in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained and also because, Koury ('670) teaches that a tacky fiber material is required to make a reinforced nodal structure, whereas GB 1 373 344 on view of FR 2 462 266 teaches a reinforced nodal structure.

10. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of Koury (US Patent No. 6,073,670).

Huybrechts *et al.* ('274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claims 20-21, Huybrechts *et al.* ('274) in view of FR 2 462 266 does not teach a feeder head under computer numerical control that severs length of reinforcement material. Koury ('670) teaches a fiber placement head that places fiber material into channels of a nodal mold such that both the fiber head and the mold are movable and under computer numerical control (see col. 3, lines 19-53). Further, Koury ('670) teaches that said fiber placement head includes a cutter means (see col. 4, lines 35-36). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of reinforcement material as taught by Koury ('670) in the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a

feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained.

In regard to claim 22, Huybrechts *et al.* ('274) in view of FR 2 462 266 do not teach a tacky reinforcement. Koury ('670) specifically teaches a tacky reinforcement material that is placed into channels of a nodal mold (see col. 4, lines 5-10). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of tacky reinforcement material as taught by Koury ('670) in the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained and also because, Koury ('670) teaches that a tacky fiber material is required to make a reinforced nodal structure, whereas GB 1 373 344 on view of FR 2 462 266 teaches a reinforced nodal structure.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of Mayes, Jr. *et al.* (US Patent No. 4,137,354).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 23, GB 1 373 344 in view of FR 2 462 266 does not teach introducing an insert in order to provide localized strengthening. Mayes, Jr. *et al.* ('354) teach a carbon fiber reinforced nodal structure having an insert (18) positioned at each node (12) (see col. 3, lines 34-36). Therefore, it would have been obvious for one of ordinary skill to have provided an insert positioned at each node as taught by Mayes, Jr. *et al.* ('354) in the reinforced nodal structure obtained by the process of GB 1 373 344 in view of FR 2 462 266 because, Mayes, Jr. *et al.*

(‘354) teach that such inserts provides for improved strength because said fibers intersect about said insert (see Figure 2) and also because, both GB 1 373 344 and Mayes, Jr. *et al.* (‘354) teach similar end products and materials.

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of Mayes, Jr. *et al.* (US Patent No. 4,137,354).

Huybrechts *et al.* (‘274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 23, Huybrechts *et al.* (‘274) in view of FR 2 462 266 does not teach introducing an insert in order to provide localized strengthening. Mayes, Jr. *et al.* (‘354) teach a carbon fiber reinforced nodal structure having an insert (18) positioned at each node (12) (see col. 3, lines 34-36). Therefore, it would have been obvious for one of ordinary skill to have provided an insert positioned at each node as taught by Mayes, Jr. *et al.* (‘354) in the reinforced nodal structure obtained by the process of Huybrechts *et al.* (‘274) in view of FR 2 462 266 because, Mayes, Jr. *et al.* (‘354) teach that such inserts provides for improved strength because said fibers intersect about said insert (see Figure 2) and also because, both Huybrechts *et al.* (‘274) and Mayes, Jr. *et al.* (‘354) teach similar end products and materials.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of White *et al.* (US Patent No. 5,427,725).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 22, GB 1 373 344 in view of FR 2 462 266 does not teach tackifying the fiber reinforcement. White *et al.* ('725) teach molding a fiber composite including, a first step of partially curing a tackified fiber reinforced composite and a second step of molding said tackified composite (see Abstract). It would have been obvious for one of ordinary skill in the art to have tackified the fiber reinforced preform as taught by White *et al.* ('725) in the process of GB 1 373 344 in view of FR 2 462 266 because, White *et al.* ('725) specifically teach that tackifying provides for net-shape molding of fiber reinforced composite structures, which in turn reduces production time, hence increasing productivity.

14. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of White *et al.* (US Patent No. 5,427,725).

Huybrechts *et al.* ('274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 22, Huybrechts *et al.* ('274) in view of FR 2 462 266 does not teach tackifying the fiber reinforcement. White *et al.* ('725) teach molding a fiber composite including, a first step of partially curing a tackified fiber reinforced composite and a second step of molding said tackified composite (see Abstract). It would have been obvious for one of ordinary skill in the art to have tackified the fiber reinforced preform as taught by White *et al.* ('725) in the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, White *et al.* ('725) specifically teach that tackifying provides for net-shape molding of fiber reinforced composite structures, which in turn reduces production time, hence increasing productivity.

15. Claims 17-18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deckers *et al.* (US Patent No. 6,050,315) in view of FR 2 462 266.

Deckers *et al.* ('315) teaches the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels (22) of a nodal mold, closing said mold with pressure plates (130) and curing said resin (see col. 11, lines 5-10 and 40-65; Figure 17).

Regarding claims 17-18, although Deckers *et al.* ('315) teaches a plurality of resin pre-impregnated carbon fibers having constant cross-section, Deckers *et al.* ('315) does not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated carbon fibers in the process of Deckers *et al.* ('315) because, FR 2 462 266 specifically teaches that a fiber reinforced material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

In regard to claims 20-21, Deckers *et al.* ('315) teaches a feeder head under computer numerical control that severs length of reinforcement material (see col. 7, line 27 through col. 8, line 18).

Specifically regarding claim 22, Further, Deckers *et al.* ('315) teaches thermal tacking of previously laid reinforcement material (see col. 7, lines 15-26).

Conclusion


16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396 (until December 22, 2003) and (571) 272-1208 (after December 23, 2003). The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached at (703) 305-5493 and (571) 272-1196 (after December 23, 2003). The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD


Primary Examiner 12/14/03

AU 1732

December 14, 2003